DATAMATION 84

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GETTING A GRIP ON MICRO SOFTWARE

ALSO

TYING THE MICRO-MAINFRAME KNOT

ORWELL THAT ENDS WELL

WHAT, IF ANYTHING, IS A RELATIONAL DATABASE?

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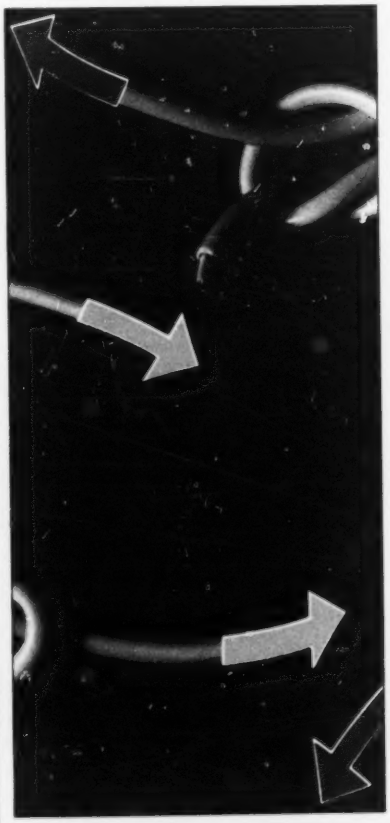

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The personal computer is making change a constant in information centers.

THE EVOLUTION OF THE INFORMATION CENTER

by Tor Guimaraes

The evolution of the information center owes a lot to creationism. As is so often true in the dp world, IBM did the creating. Or, at least, the naming.

The concept that became known as the information center first arose in the '60s, but when IBM gave the idea a name in the '70s, information centers took off. And the explosive growth of personal computing in American corporations since then has made the information center a necessity.

Here's how the information center has evolved so far. I will also describe the shape I believe the information center must take in order to ensure that personal computing is a corporate computing asset.

The overwhelming growth of personal computing in organizations has created problems and situations that need to be managed, but the control mechanisms that are established must not stifle personal computing freedom within the organization.

Companies have learned that user participation in equipment acquisition, systems development and operation, education, and problem solving should be promoted. But MIS professionals must assume the responsibility of assisting users as they seek to satisfy their information needs.

MIS departments that don't accept this new challenge will find themselves increasingly isolated from company business activities and left to perform only the more mundane or specialized corporate information tasks. Personal, end-user computing grew out of the introduction of microcomputers in the late 1970s, and the concept has had little time to evolve in managerial terms. Yet, the experience of many companies reveals a strongly perceived need to manage user computing through information centers.

In the information center format, users depend on their MIS departments for resource acquisition, primarily because the software usually resides on the organization mainframe. But users may either access a generalized software package (usually purchased and installed by the MIS department) or user-developed applications software. The MIS departments provide training, education, and operational support. User access to application software is through a wide variety of terminals (crts, hardcopy, plotters) that may be centrally located or scattered throughout user departments. Access to these terminals may be controlled by the MIS department, the user department, or by individual users.

To meet these new challenges, the information center has evolved in several ways, handling its own problems and meeting its clients' needs with ad hoc solutions. I want to talk about this evolution and propose some changes in how most companies manage their information centers.

Phase I information centers: the past. Despite the existence of report-generating software packages such as Easytrieve and Mark IV, in this historic environment, end-user access to computer terminals was rarely possible. Few companies had any end users operating mainframe terminals. For the most part, the MIS department controlled all aspects of computing, from resource acquisition and systems development to report generation. The number, types, and capabilities of the software packages then commercially available was, of course, rather limited compared with what is available today.

Phase II information centers: the present. Motivated by the urgent need of MIS departments to reduce the backlog of user requests for information, in the late '70s IBM introduced the concept of an information center.

To reduce this backlog, IBM proposed that organizations make available to present and prospective computer users tools that would allow them to do their own computing. While the MIS departments would provide the necessary training, an integral part of the IBM information center concept was the notion that users *must* do their own computing. In addition to terminals, the suggested user computing tools included a wide assortment of software packages and procedural languages. Personal computers were not included in the IBM proposal for information centers.

Phase III information centers: the future. In direct contrast with the phase II notion that users must do their own computing, the cornerstone of phase III information centers is full user support. Full user support means that MIS departments assist users to satisfy their information needs by providing as many computing alternatives as possible, including developing systems for users whenever possible. The MIS department helps users select the appropriate solution to their specific problem, provides them with appropriate education and training, and assists them with problem management.

USERS SHOULD CHOOSE

Individual users should be able to choose any viable computing alternative as long as user department managers are willing to pay for it and overall company interests have been protected. It is important that MIS departments educate business managers about the company-wide and long-term implications of their departmental computing decisions.

Many user computing activities need to be managed in an integrated fashion under the aegis of the MIS department, among them, matching of user requests for information with appropriate computing alternatives, user training, user computing equipment acquisition, and problem management.

An opinion survey of MIS managers about problems encountered with personal computing reveals several items that may represent significant and unnecessary costs to an organization:

- Users of personal computers throughout the organization tend to "reinvent the wheel" by not sharing knowledge or access to tools, methods, vendors, etc.
- Because of their isolation, many users learn through an expensive process of trial and error.
- Since user experience about the managerial aspects of computing is cultivated through trial and error, exposure to major disasters is common. For example, file backup and recovery and system quality assurance measures are issues neglected by most users according to many MIS managers who are in

Personal computer users throughout the organization tend to reinvent the wheel.

THE TROUBLE WITH USERS

Major personal computing problems were identified by 52 MIS managers attending a seminar on information center management. This sample represents a wide cross-section of large- and middle-sized companies from several industries. The managers were presented with a list of possible problem areas and were asked to indicate, on a scale of 1 to 5, their level of concern with each problem: 1. not concerned at all, 2. a little concerned, 3. concerned, 4. very concerned, 5. extremely concerned. They were also instructed to add to the list as they saw fit, and the results were used to tailor the seminar to their needs. Here is the final list of problems. The respective average level of concern is within parentheses.

(4.1) Unnecessary high costs to the company due to users "reinventing the wheel" in systems development.

(4.3) Unnecessary high costs to the company due to users learning by trial and error how to use available software packages.

(2.3) Unnecessary high costs to the company due to users learning by trial and error how to negotiate with vendors.

(2.6) Unnecessary high costs to the company due to users learning by trial and error about lack of compatibility with other micros.

(4.6) Unnecessary high costs to the company due to users learning by trial and error about lack of compatibility with mainframe(s).

(1.7) Unnecessary high costs to the company due to users learning by trial and error about lack of compatibility with microcomputer peripherals.

(4.6) Poor maintainability of user-developed systems.

(3.5) Lack of adequate support from hardware vendors.

(3.2) Lack of adequate support from software vendors.

(4.2) Contamination of corporate data on the company's mainframe.

(4.4) Overwhelming growth of user requests for assistance from the MIS department.

(3.2) Lack of control over user computing resources utilization in user departments by the MIS department.

(3.6) Lack of control over user computing resources utilization in user departments by the user department management.

(3.9) Lack of user knowledge or concern about microcomputer data integrity measures such as a file backup.

(3.1) Lack of user concern about personal computing equipment security.

(1.4) Malicious or unauthorized user behavior regarding company property.

(4.7) Lack of user education regarding a companywide and a long-term perspective about personal computing.

(3.2) Personal computing is further straining MIS department relations with users.

(4.2) Mismatch of user applications to other possible user computing alternatives, such as mainframe packages or the traditional approach for systems development.

(4.8) Lack of a company plan for personal computing.

(4.5) General lack of communication between the MIS department and users.

(3.1) Information overloading due to too many vendors and products in a given area: micros, software packages, local area networks, etc.

(4.2) MIS department has image problem with personal computing users.

(2.9) Lack of integration in MIS management of personal computing and mainframe user computing.

(3.2) Lack of centralized management over corporate data resources to support user personal computing.

(4.2) Lack of equivalent or better (more user-friendly, etc.) mainframe software packages to compete successfully with microcomputer software packages.

(3.7) Inability of mainframe computing to compete with personal computing in terms of cost/benefit in certain areas.

(2.9) Lack of user interest in using personal computers.

(2.1) Measuring the level of user computing activity.

(3.8) Lack of integration of micro/mainframe data exchange and control.

(4.2) Lack of adequate training on products, computer concepts, etc.

(3.2) Lack of appropriate staffing to identify and service potential information center customers.

touch with personal computing activities in their companies. But, worse, some MIS managers admit to a complete or substantial lack of knowledge about such activities.

- Many technical problems require a substantial investment of user time for solution. In many cases, it is in the organization's best interest that the problem be addressed by MIS professionals who have considerably more knowledge on the subject.

Many personal computing problems can be corrected by business managers if the problem is brought to their attention, so it is important that MIS and business managers periodically consult on the user computing activities within individual departments.

Several organizations with substantial personal computing activity have saved millions of dollars by implementing or promoting relatively simple measures such as:

- Centralized microcomputer acquisition;
- a "help desk" to which users can go for advice and assistance on computing problems;
- user groups on various software products;
- short "consciousness raising" seminars on

FIG. 1

APPARENT TRENDS IN PERSONAL COMPUTING BASED ON 96 ORGANIZATIONS SURVEYED (1982-1984)

	1982	1984
Companies with business personal computing	13	68
In the selection and acquisition of personal computers, the MIS department has:		
control over the selection process	2	52
advisory capacity only	6	13
no input	3*	3*
Formal user training program	0	26
Formal help desk	0	33
Company planning for personal computing	0	8
Local area networking	0	12
User groups	2	41
Personal computing library	0	29
Equipment demonstration facilities	2	38

*These organizations are not the same three

The most important change in data management will be the increased level of direct service to personal computing users.

the benefits and problems of personal computing, in which companywide and longterm perspectives are emphasized.

There are some computing processes and managerial tasks that are performed more effectively when integrated throughout the organization and across all user computing alternatives. It is the MIS manager's duty to persuade company management that this integration is needed. Examples of processes amenable to integrated management include dispensing information on overall company computing resources, planning for computing resources acquisition, and matching user information requirements with appropriate computing alternatives.

Many organizations have grown so large that organizational subunits and individuals within these units are completely unaware of the relevant activities of others. This knowledge isolation leads to unnecessary costs. A critical task of the information center is to collect and disseminate information about available computing resources (equipment, user-developed systems, software packages, and data) that can be shared. This requires the centralization of knowledge about all company computing activities, including personal computing.

MASTER PLAN FOR COMPANY

Planning resource acquisition for personal computing and for information centers must be integrated under a master plan for all company computing activities. Future user information requirements can, to a considerable extent, be satisfied by more than one computing alternative. The planning of any one alternative will affect the others. For example, if the MIS department is not aware that a significant number of users will be acquiring personal computers instead of using the terminals attached to the company mainframe, MIS capacity plans will be significantly inaccurate.

Matching users with appropriate computing alternatives, a task totally neglected by phase II information centers, receives great emphasis under the phase III concept. It is imperative that information centers have mechanisms to make prospective computer users aware of alternatives to personal computers and that users' requirements be matched with these alternatives.

Countless personal computer users have spent substantial amounts of time and resources in developing systems (databases) on microcomputers. Only later do they discover severe limitations to a system's ability to evolve and that more powerful tools were available on the company mainframe.

Because good matching requires substantial knowledge of microcomputers as well as mainframe tools, many companies effectively use a committee with two or three members as the matching mechanism.

In early 1982, a survey of 96 northeast Ohio business organizations with gross revenues ranging from $50 million to over $2 billion was undertaken to evaluate the state of user computing. At that time, in 13 of the organizations personal computers were being used for business applications (see Fig. 1). By early 1984, 68 of the same organizations had at least one personal computer being used for the same purposes.

In 1982, four of the MIS departments had some measure of control over the selection and acquisition of personal computers, six had advisory capacity only, and three had no input at all. For 1984, the figures were 52, 13, and three, respectively. The three organizations at which MIS departments had no input in early 1984 now have standard vendor equipment, and users receive considerable support from MIS.

No organization provided any formal training for the users in 1982 compared with 26 companies that now have at least one course related to personal computing.

No organization had a help desk, or used local area networks to share computing resources or to communicate. Now, the figures are 33 and 12, respectively. Two companies had recognized user groups compared with 41 companies today. While no company had a personal computing library before, 29 presently have one. Only two organizations gave hardware and software demonstrations to users compared with today's 38.

These changes—implemented in the last two years—are rated as major successes by the MIS managers. Very likely more companies will find them useful with time.

Besides these trends, some important future developments can be forecast.

In most organizations personal computing users will substantially increase the demand for data resources inside and outside the corporation. MIS departments in the immediate future will have a renewed interest in purchasing data administration tools, such as data base management systems (DBMS) and data dictionaries and directories (DDD).

The trend toward substantially more powerful and user-friendly DBMSs, for microcomputers will continue, even though mainframes will remain the dominant store for corporate data.

The most important change in data management will be the increased level of direct service to personal computing users. Dispensing information on data item availability, access requirements, and cost will become a major component of the data administration function. Many MIS departments are planning to include data items on outside databases as part of their service responsibility to their user communities.

An important new development for MIS departments will be methodologies to teach users to define their information requirements. Several new approaches have been tested with promising results. MIS managers feel that having prospective computer users define their own information requirements is in most cases more efficient than asking users to try to communicate their requirements to an analyst. Also, most MIS managers are delighted to see the people-intensive process of information requirements definition shifting toward user departments.

The major obstacle to widespread use of this concept seems to be a generally low credibility of MIS departments with business managers. MIS managers are reluctant to try the exercise on their own and prefer to use an outside consultant. This is likely to be a temporary problem, however. Based on the encouraging results, the idea is likely to spread. It will eventually become common practice in most organizations. ❁

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"'Sir'?—Who the hell do you think you're calling 'sir'?"

CARTOON BY REX F. MAY